US Central Command Technology Development

Distribution A. Released for Public Distribution

CENTCOM - Area of Responsibility

Complex

- **20 Countries, 4.5 million square miles**
- **1.1 Million square miles of ocean**
- **531 Million people, 16 major ethnic groups**
- **7 Major languages, hundreds of dialects**
- **4 Major religions**

Global Economic Impact

- **Arabian Gulf produces ~ 31% of world crude oil**
- **Region exports ~ 26% of global LNG supply**
- **3 x Strategic Choke Points**
  - **Appx 40% internationally traded oil transits SoH**
  - **21% of LNG goes through Strait of Hormuz**

Vision & Objectives

CENTCOM vision for the AOR is a region where ***improved security*** leads to ***greater stability*** and where ***regional cooperation*** helps to ***isolate and counter*** those who would use violence in pursuit of their goals . . . .

In pursuit of our vision we will:

- Expand stability, self-governance, development and security in Iraq
- Set conditions for security and strengthen governance in Afghanistan
- Degrade violent extremist networks, operations, and sanctuaries; with defeating al-Qaeda the priority
- Counter the proliferation of WMD
- Strengthen relationships and influence organizations and states to contribute to regional stability and the free flow of commerce
- Posture the force to build and sustain joint and combined warfighter capabilities and readiness

What keeps the Boss awake at night . . .

The enemy we don't know

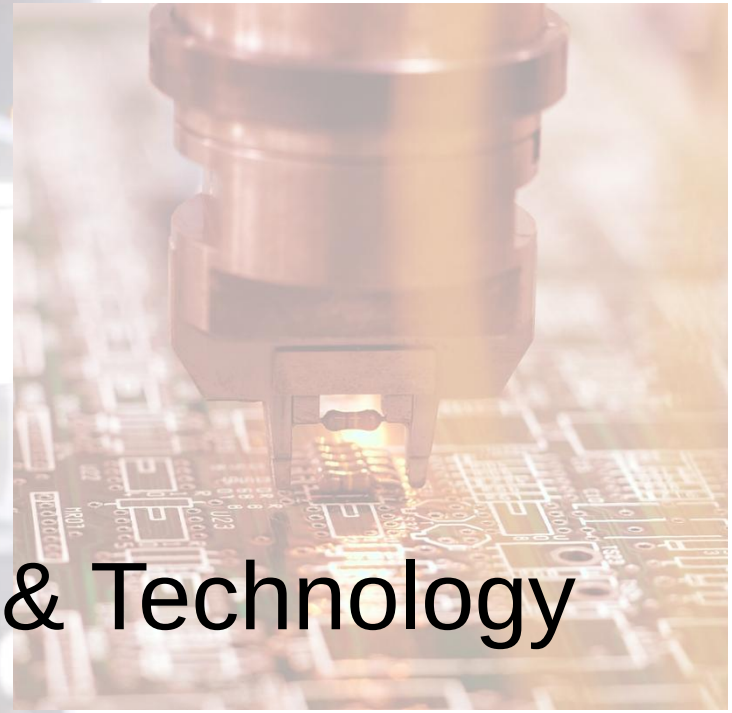
&

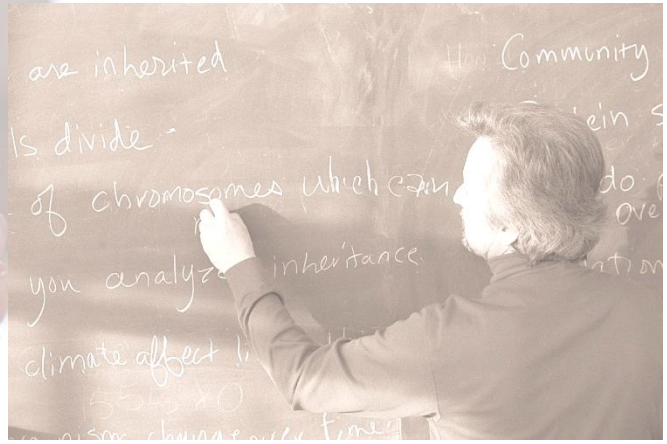
Has the ability to keep us at arms length

In a nutshell . . .

Anti-access / Area Denial & Indications & Warning are our biggest challenges as we end OEF, withdraw boots on the ground, and become more maritime focused.

The Role of Science & Technology





Charter

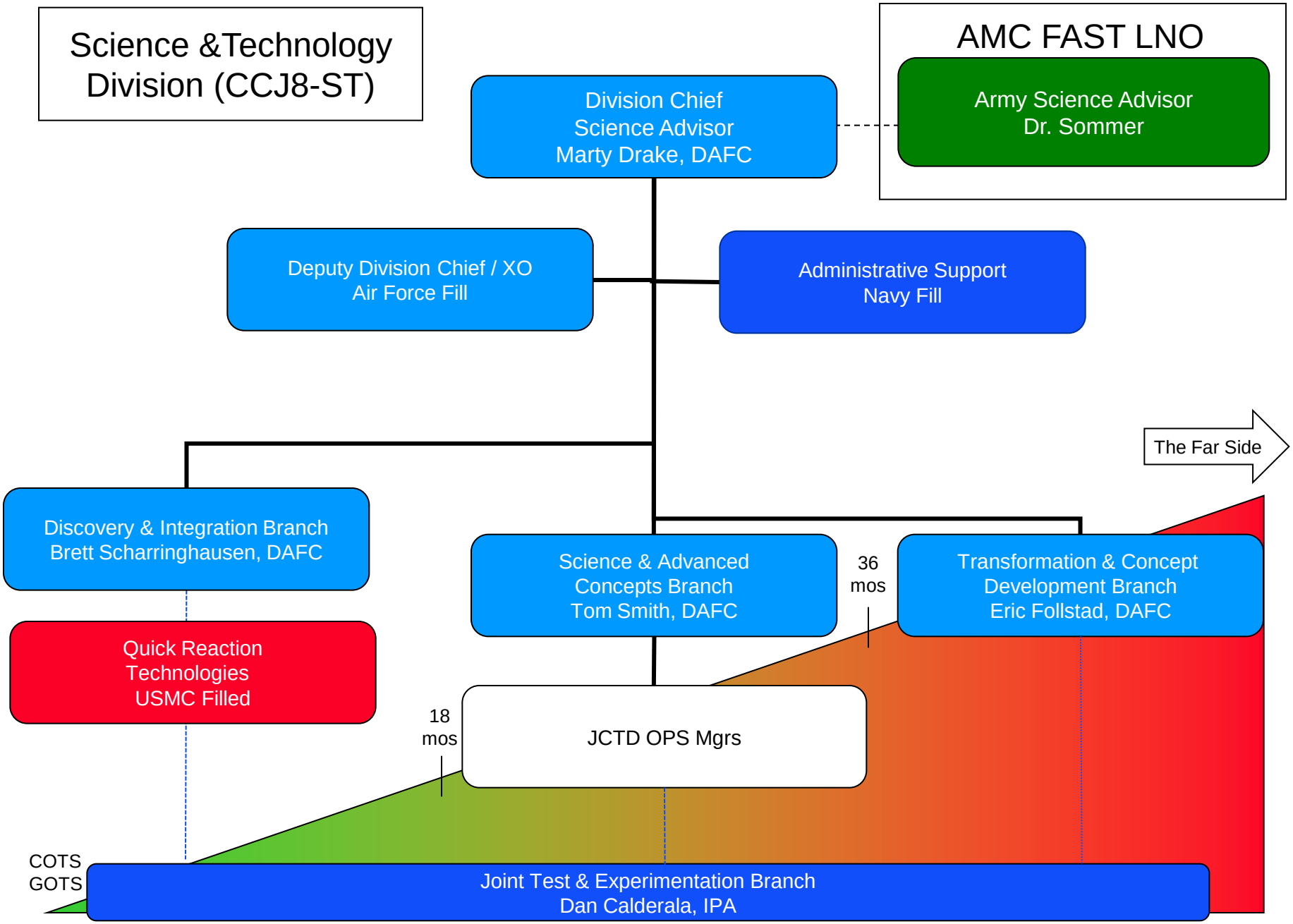
Conduct ***discovery***, ***research***, ***analysis***, and ***sponsor development*** of new and emerging technologies and techniques which have the *potential to provide solutions* to Headquarters and Component validated Joint needs.

Review USCENTCOM and Component ***plans, operations***, programs, policies and activities for areas where technology will improve efficiency and effectiveness.

Integrate across USCENTCOM headquarters and Component staffs for transformational, integrating, and experimentation activities.

What we do

- **Technology discovery, research & analysis, and inform the staff & OSD on promising initiatives**
  - **Attend technology symposiums / reviews**
    - **Service Labs, DARPA, FFRDCs**
    - **Private industry & Academia**
  - **Conduct global market research**
  - **Provide initial feasibility / technical merit on proposals**
- **Needs pull**
  - **Conduct HQ USCENTCOM Leadership, Directorate, & Component outreach**
  - **Participate in planning, operations, & exercises**
  - **Review submissions from the requirements generation processes for technology needs to support the Warfighter**
- **Operationally Manage technologies we sponsor**
- **Participate in limited objective experiments**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USMC Filled
18 mos
JCTD OPS Mgrs
COTS
GOTS
Joint Test & Experimentation Branch
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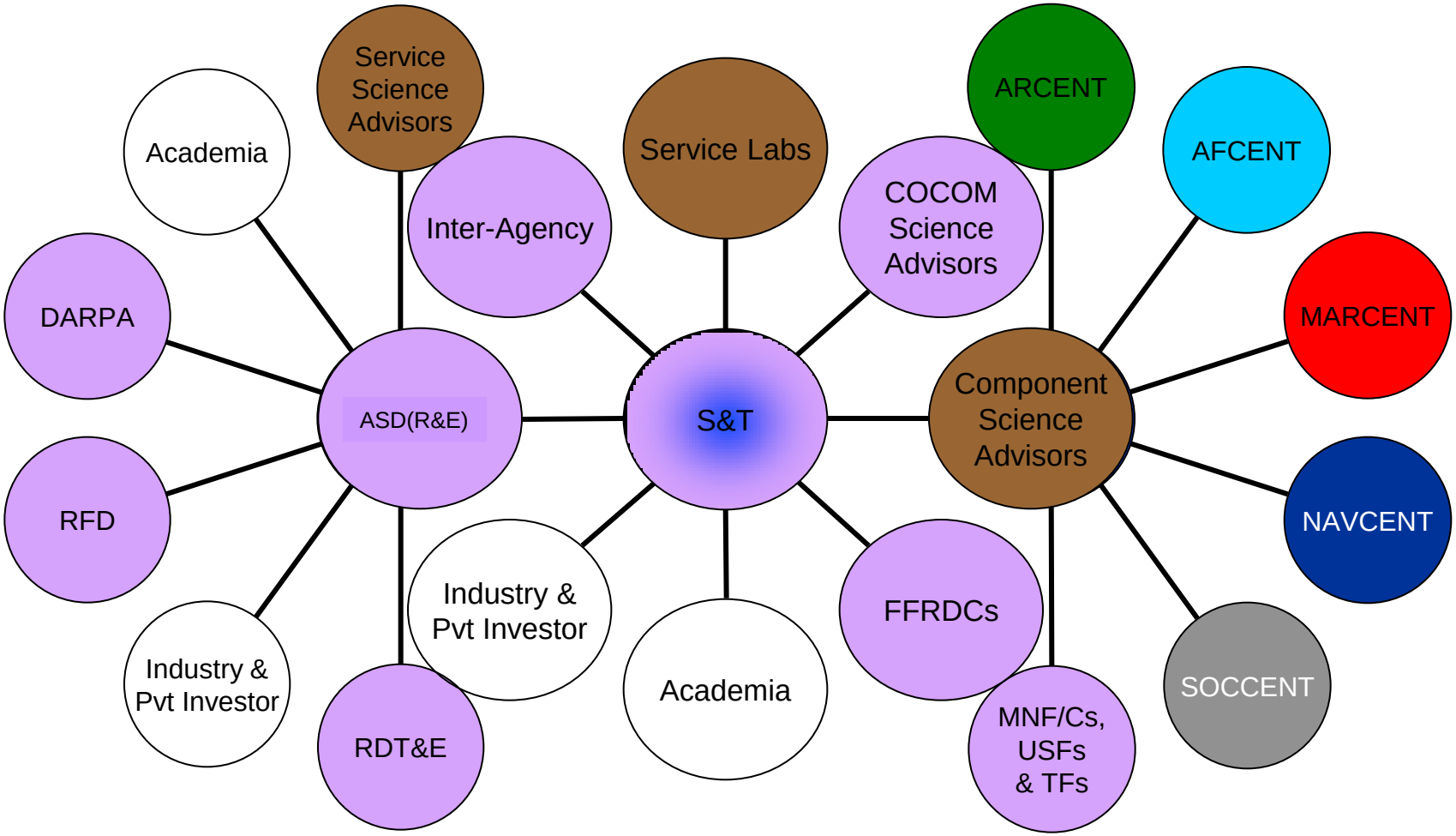
How we connect



U.S. Central Command Tech Focus

- **We focus on the JOINT solution that has the potential to satisfy a JOINT validated need**
- **Separate from the many technology needs of our customer(s) those technology challenges which:**
  - ***Do not have a readily available solution***
  - **For high-impact needs there is *insufficient activity pursuing a solution***
- **Seek out game-changing technologies which our customer(s) don't know they need**

Some technology areas we "pursue":

- **Detection of CBRNE at tactically significant distances; with emphasis on a little "e"**
- **Pre-shot counter-sniper, counter-mortar, counter-RPG technologies; with emphasis on automated systems**
- **Technologies which enable the transfer of information more securely, more quickly, to a wider set of users, to include the warfighter when it makes sense, with less bandwidth and dedicated support resources, e.g.:**
    - **Multi-level Security over single architectures**
    - **Bandwidth compression / reduction techniques**
    - **Data to Decision [data=>info=>knowledge=>understanding=>wisdom]**
- **Through automation, remote action, new and novel techniques & technologies which reduce risk and / or stress on the force and / or improve the efficiency and effectiveness of our action(s)**
- **Technologies which allow for greater persistence over the battlespace with fewer platforms; employing improved sensor technology providing greater fidelity of information**

Thematic areas of concern

(not in priority order)

- **Detect / Defeat:**
  - **IED initiators / initiator systems**
  - **Buried / concealed IEDs**
  - **Production and assembly of IEDs**
- **HME production standoff detection**
- **Culvert access denial / alerting**
- **Persistence in surveillance**
- **Biometrics**
  - **Identity dominance**
  - **Force protection / access**
- **Non-lethal vehicle / vessel stop**
- **Reduce stress on the force:**
  - **Force Protection requirements**
  - **Increased automation**
- **Anti-swarm lethal / non-lethal**
- **More efficient / effective / timely trng**
- **Predictive analysis techniques**
- **Voice to text technologies**
- **C4ISR systems:**
  - **Info sharing between systems**
  - **Multi-level security**
  - **Cross domain solutions**
  - **Faster … Better sorting / retrieval**
  - **On the move w/ GIG access to tactical edge**
- **Tagging, Tracking, and Locating (TTL)**
- **Lightweight "x" with greater "y"**
- **More power per unit of weight**
- **Scalable effects – non-lethal to lethal**
  - **Directed Energy**
  - **Kinetics**
- **True SA for Blue … Fused Red**
- **Sustaining the force – reduced size, weight, amount, and retrograde**
- **Holding all targets at risk *w/ min risk to US***
- **Any sensor any shooter; Soldier as a sensor; any adversary any battlespace … anytime**
- ***All things 'cyber'***

Points of Contact

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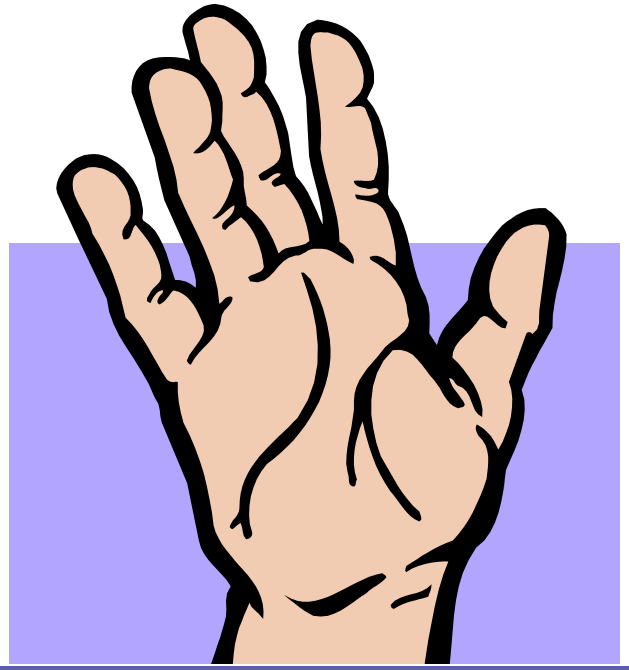

Raise your Hand

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Blah, Blah, Blah

The Nature of Our VEO Enemy

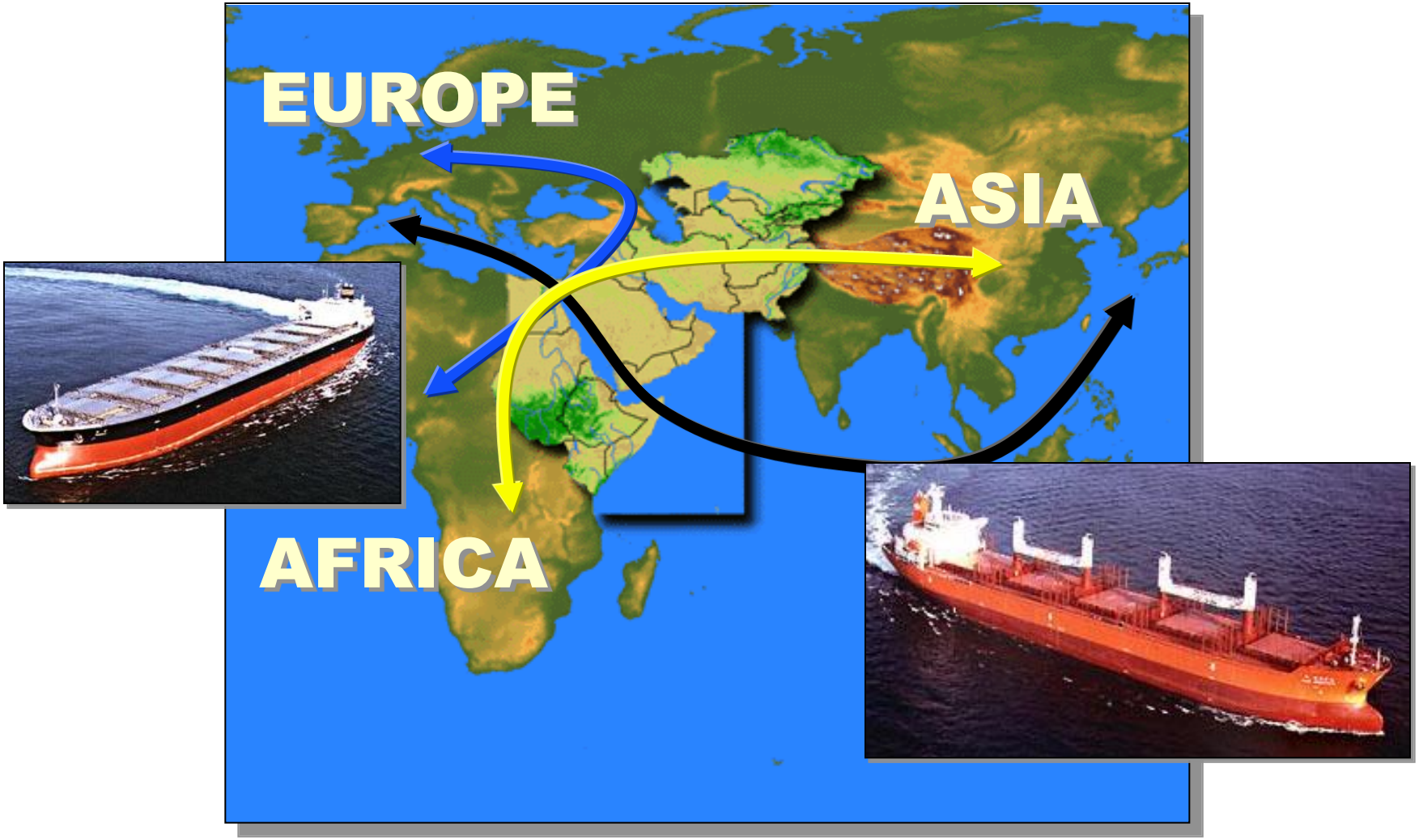
- Guided by ideology; fueled by militant zeal
- Amorphous global network which operates as a web of cells; stateless
- Powerful “Virtual Caliphate” - All directed toward the eventual establishment of a “Physical Caliphate”
- Seek safe-havens, physical footholds for recruitment, training, financing, and propaganda initiatives which complement its virtual element
- Well financed & has a simplified acquisition/training/fielding strategy

Maligned States & Rogue States

- Similar in many respects to VEOs, but . . .
- Has the capacity to hold us at distance and deny I&W
- Understands ‘the art of war’
- Exploits our political, policy, legal, & capability / capacity seams

Central Region

Crossroads of Three Continents



Strategic Interests & Mission

- **Security of the U.S. citizens & the U.S. Homeland**
- **Regional stability**
- **International access to strategic resources, critical infrastructure, & global markets**
- **Promotion of human rights, rule of law, responsible & effective governance, & broad-based economic growth & opportunity**

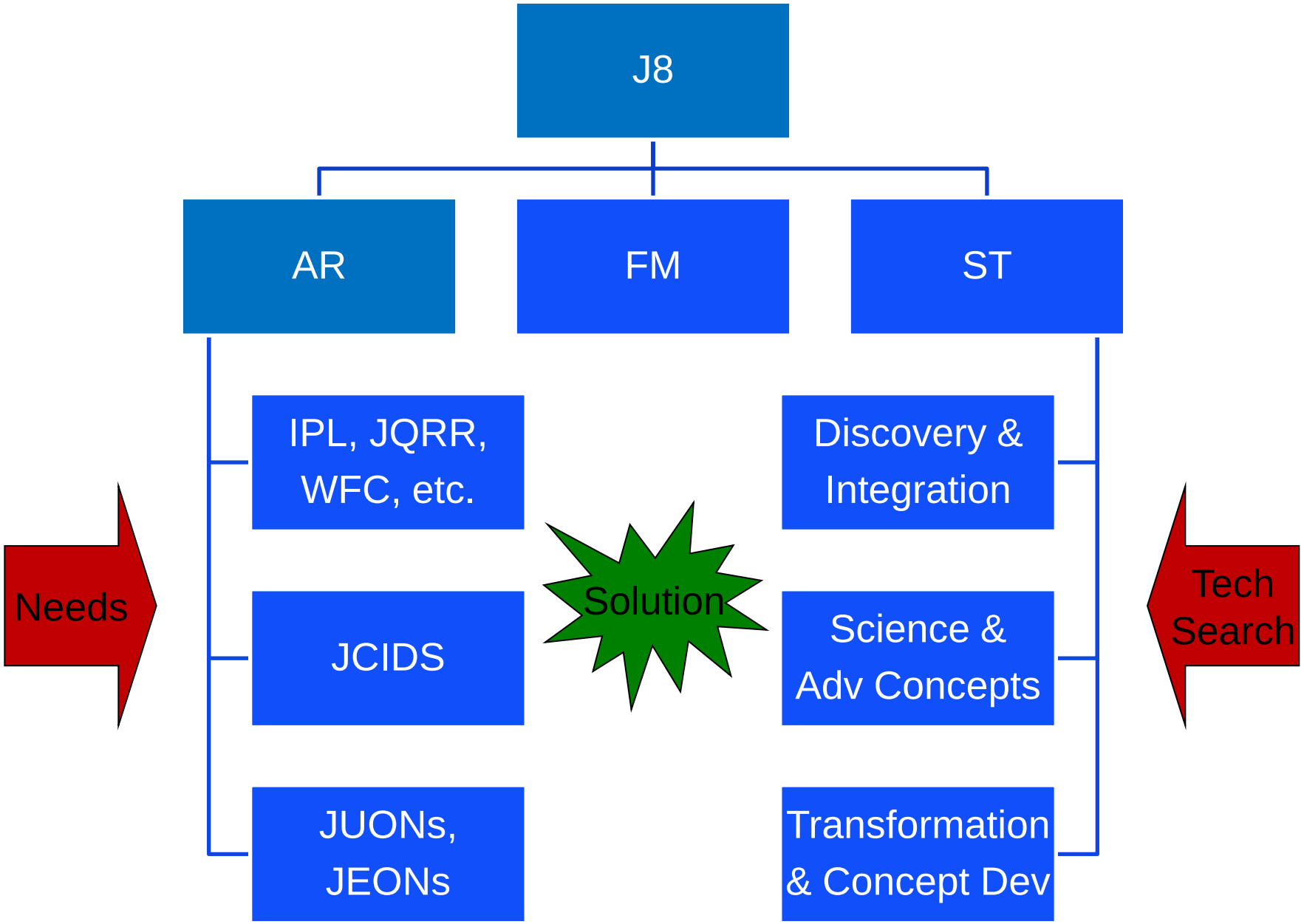
With national & international partners we will:

- **Promote security & cooperation among nations**
- **Respond to crisis**
- **Deter & defeat state and non-state aggression**
- **Support development & reconstruction to establish conditions for regional security, stability, & prosperity**

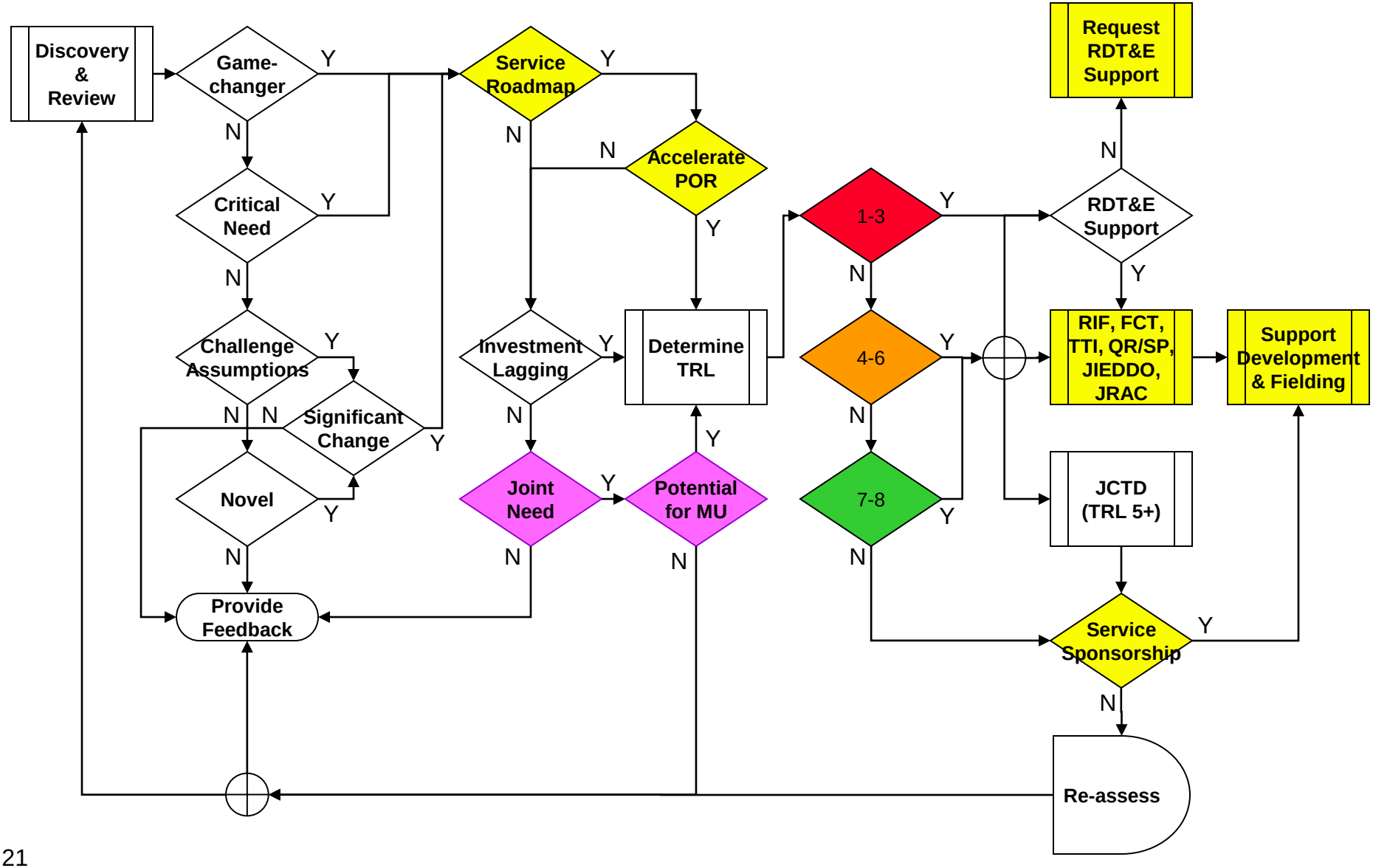
Major Activities

- **Defeat al-Qaeda & associated movements**
- **Deny sanctuary & support for violent extremist groups**
- **Counter proliferation of WMD & associated technologies**
- **Deter & counter state-based aggression & proxy activities**
- **Protect freedom of navigation**
- **Support peaceful resolution to long-standing conflicts**

- ***Develop partner nation capacity***
- ***Assist nations in their ability to protect their critical infrastructure & support robust infrastructure development***
- ***Bolster at-risk states***
- ***Respond to humanitarian crisis***
- ***Counter arms smuggling***


J8
AR
FM
ST
IPL, JQRR, WFC, etc.
JCIDS
JUONs, JEONs
Discovery & Integration
Science & Adv Concepts
Transformation & Concept Dev
Needs
Solution
Tech Search

Technology Review Process



Overall Technology Investment Strategy

Sponsor
Monitor
Proposed

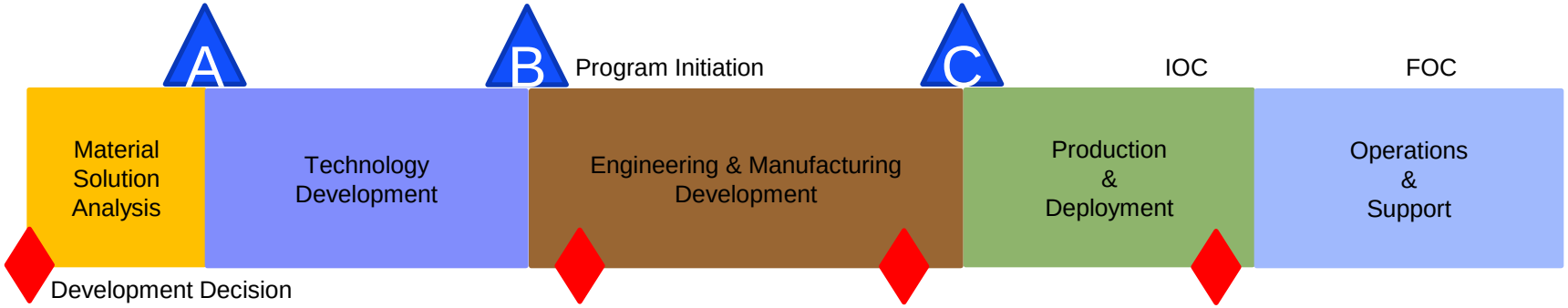
Projects | IPL | ASD(RE) S&T Pri | T-Strat

S = Sponsor M = Monitor P = Proposed	Counter Adversary Info Ops	Theater Posture	Strategic C4	Building Partner Capacity	Integrated Air & Missile Defense	Counter-Maritime Anti-Access Area Denial	Persistent & Denied Area ISR	CED and NLW	Cyberspace Capabilities	C/UH/MNT		Autonomy	Counter-WMD	Data-to-Decisions	Electronic Warfare / Electronic Protect	Engineered Resilient Systems	Human Systems		Defeat Insurgency Efforts	Enable Transition to Representative Govt	Degrade / Counter Terrorists & VEOs	Protect Freedom of Movement	Protect Free Flow of Commerce			
Joint Advance Capability Employment (S)	1								1										1		1	1			5	
Afghanistan Mission Network (S)	1	1	1	1	1	1	1	1		1							1		1	1	1	1	1		15	
Joint Military Working Dog (S)								1											1		1	1	1		5	
Joint Vehicle Protection & Survivability Sys (S)								1																	1	
One Box - One Wire (S) [re-named Black Channel]		1	1	1	1	1	1	1		1							1		1	1	1	1	1		14	
Joint Multi-Effects Weapons System (S)					1	1							1		1				1		1	1	1		8	
Medusa (S)				1	1	1													1		1	1	1		7	
Fixed Wing Advanced Precision Kill Weapon System					1	1													1	1	1	1	1		7	
DSEHEDMN (CIED Robot) (S)				1				1				1	1				1		1	1	1	1	1		10	
3D Landing Zone (S)		1										1					1								3	
Coalition End-to-End Enhanced Maritime Interdiction Operations Performance Optimization (S)			1	1		1				1				1			1		1	1	1	1	1		11	
CISA (28m Aerostat) (S)			1				1	1											1	1	1	1	1		8	
Machine Foreign Language Translation System (S)	1			1						1				1			1		1	1	1				8	
Anti-Swimmer (S)						1													1		1	1	1		5	
Zephyr (S)		1	1		1	1	1	1											1	1	1	1	1		11	
Combat Dragon II (S)		1		1	1	1	1	1						1					1	1	1	1	1		12	
Gorgon Stare (S)			1		1	1	1	1				1	1	1					1	1	1	1	1		13	
Autonomous Mobility Applique System (P,S)		1						1				1					1		1	1	x	1	1		8	
Magic View (P,S)		1	1	1		1	1							1			1					1	1		9	
Expeditionary Waste Water Recycling (P,S)		1		1																					2	
Tactical Aerial Layer Comms (P,S)		1	1		1	1	1	1									1		1		1	1			10	
Multi-Level Secure Handheld (P,S)			1											1			1		1		1				5	
Gatekeeper on the Move (P, S)								1					1	1			1		1			1	1		7	
Multi-Mission Tomahawk (P,S)		1			1	1													1		1	1	1		7	
Sweeper (P,S)								1											1	1	1	1			5	
Skystrike (P,S)																			1		1	1			3	
PELTA (P,S)						1		1											1		1	1			5	
PSS Tether Testing (P)			1				1	1											1	1	1	1	1		8	
Tower Hawk (S)		1					1	1				1							1	1	1	1			8	
Pre-det Challenge (P)	1	1		1				1											1	1	1	1			8	
Media Scrape (P, S or M)	1								1	1		1	1	1					1	1	1				9	
Max Power							1								1				1	1	1	1			6	
mmW (M)					1	1									1							1	1		5	
Counter-Mine (M)		1				1						1										1	1		5	
Molecular Power System (M)		1		1																					2	
Theranos (M)													1	1			1								3	
Tarantula (M)								1											1	1	1	1			5	
Structural Blast Channel Vehicle (M)								1											1	1	1	1			5	
Secure Tablet (M+)			1											1			1								3	
Persistent Ground Surveillance System (M)		1	1		1	1	1	1											1	1	1	1			10	
Total	5	15	12	11	12	17	12	20	2	5		7	6	10	3	0	13		31	20	29	31	20			

High
Payoff
Projects

Investment Balance

Simplified DoD Acquisition Process



Version 5.3.4 1 June 2009

Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management

DoD Decision Support Systems Effective Interaction is Essential

Following the Materiel Development Decision, the Milestone Decision Authority may authorize entry into the acquisition process at any point, consistent with phase-specific entrance criteria and statutory requirements

This chart is a classroom aid for Defense Acquisition University students. It provides a notional illustration of interfaces among three major decision support systems used to develop, produce and field weapons systems for national defense. Defense acquisition is a complex process with many more activities than shown here and many concurrent activities that cannot be displayed on a two-dimensional chart. Supporting information is on back of this chart. For more information, see the Acquisition, Technology, and Logistics Knowledge Sharing System (http://dasc.sax.mil).

Materiel Solution Analysis Phase

Complete Analysis of Alternatives to assess potential materiel solutions to capability need, identify key technologies and estimate life cycle costs. Consider commercial-off-the-shelf and solutions from both large and small business. Identify materiel solution to

Technology Development Phase

Reduce technology risk, determine and mature appropriate set of technologies to integrate into full system, demonstrate critical technology elements on prototypes, and complete preliminary design. Identify an affordable program or increment of militarily useful capability, demonstrate technology in relevant environment, and identify and

Engineering & Manufacturing Development Phase

Develop a system or increment of capability; complete full system integration, develop affordable and executable manufacturing process; ensure operational supportability; reduce logistics footprint; implement human systems integration; design for producibility; ensure affordability; protect critical program information; and demonstrate

Production & Deployment Phase

Achieve operational capability that satisfies mission needs. Low-rate initial production (limited deployment for software intensive systems with no development hardware) and full-rate production (full deployment for software intensive systems). Deliver fully funded quantity of systems and supporting materiel and services for production

Operations & Support Phase

Execute support program that meets materiel readiness and operational support performance requirements and sustains system in most cost-effective manner over its total life cycle. Conduct

Joint Capabilities Integration & Development System

System (need-driven)

Oversight & Review

Contracting

Major Products

Logistics/ Sustainment

Defense Acquisition System (event-driven)

Technical

Cost

Planning, Programming, Budgeting & Execution Process (calendar driven)

Decision Points/Milestones

Strategic Guidance

Joint Operations Concept/ Concept of Operations/ Operations Plans

Capabilities-Based Assessment

ICD

JROC/ Component Validation Agent

DCR

MDD

MS A

MS B

MS C

FRP DR

IOC

FOC

Initial Evolutionary Acquisition Strategy

Technology Development Strategy (TDS)

Acquisition Strategy

Technology Development Contract

Source Selection Plan

Alternative Materiel Solutions

Define Supportability Objectives

Evaluate Product Support Capabilities

Develop Initial Product Support Strategy

Initial Product Support BCA (Define Ground Rules & Assumptions)

Prototypes

Engineering & Manufacturing Development Contract

Product Support Plan

Demonstrate Product Support Capability

Production Representative Articles

LRIP Contract

Low-Rate Initial Production Systems

Full-Rate Production Systems

Product Support Package/PBL Implementation

Product Support/PBL Management

Operations and Sustainment

Total Life Cycle Systems Management

Pre-IOC and Post IOC Supportability Assessments

Cost Estimation Methods

Types of Funds

RDT&E = Advanced Technology Development

RDT&E = Advanced Component Development and Prototypes

RDT&E = Systems Development & Demonstration

RDT&E = Management & Support

Procurement

Operations and Maintenance

Appropriated Funds To Support Contracts

Military Departments and Defense Agencies

Office of the Secretary of Defense and Joint Staff

White House

POM/Budget Formulation

POM/Budget Submit

Guidance for Development of the Force

Joint Programming Guidance

Program Review

Final PBD

DoD Budget

President's Budget to Congress

Congress

Budget Committees

Authorization Committees

Appropriation Committees

Authorization/ Appropriation Acts Passed

Apportionment

DoD Testimony

DoD Appeals

Allocation

For a single copy of this chart, send a request to dauaudio@dau.mil

Send recommendations to improve the content of this chart to wallchart@dau.mil

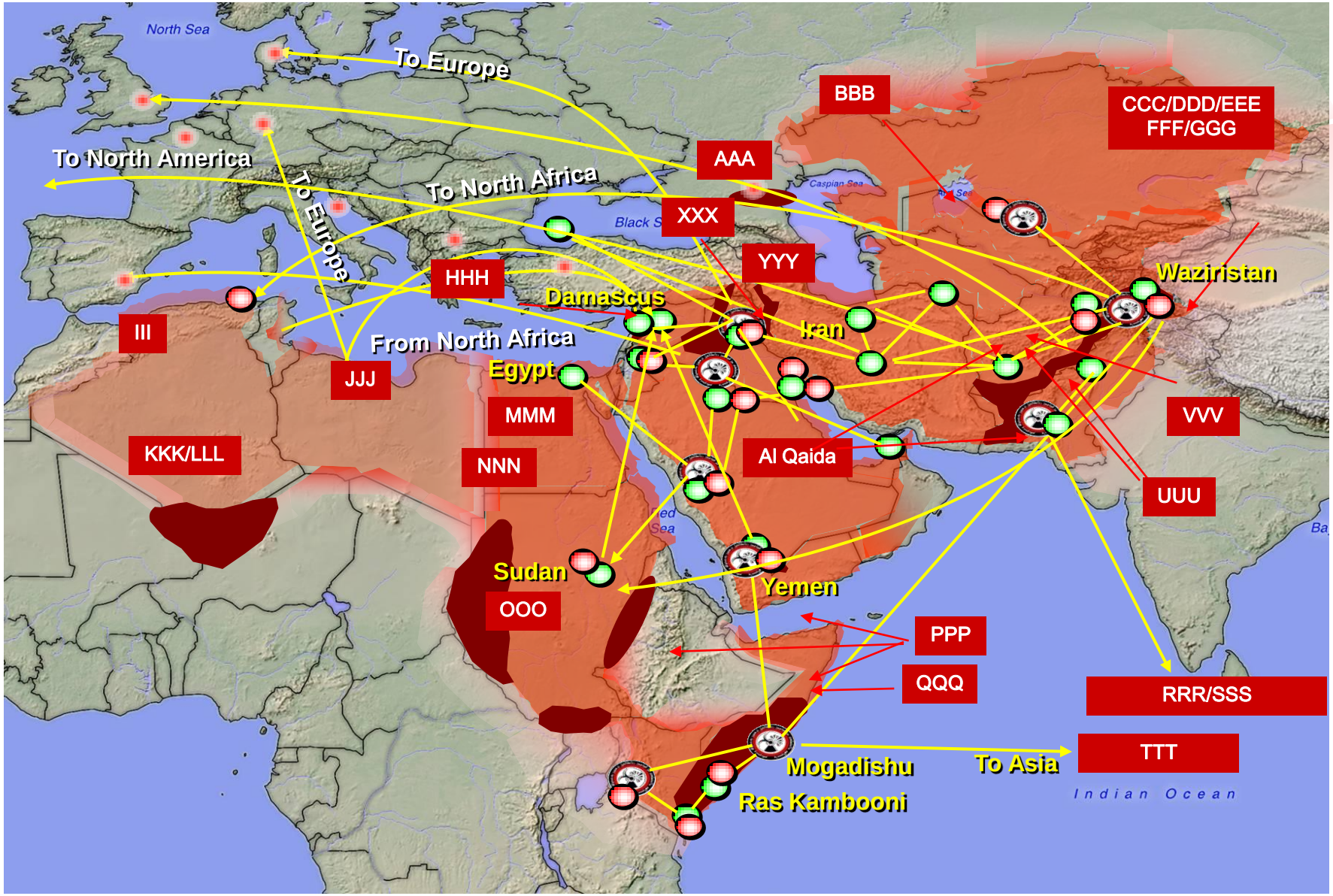
When proposing a solution …
The Heilmeier Questions … adapted

- **What are you trying to do?**
  - **Articulate your objectives using absolutely no jargon**
- **Who should care?**
- **How is it accomplished today?**
- **What are the limits of the current practice?**
- **What is new in your approach?**
- **Why do you think you will be successful?**
  - **How do you define / measure success?**
  - **What is your strategy to get there?**
- **How long will it take and at what cost?**
- **What are the risks?**
- **What is your risk reduction / mitigation strategy?**
- **What are the payoffs / return on investment?**

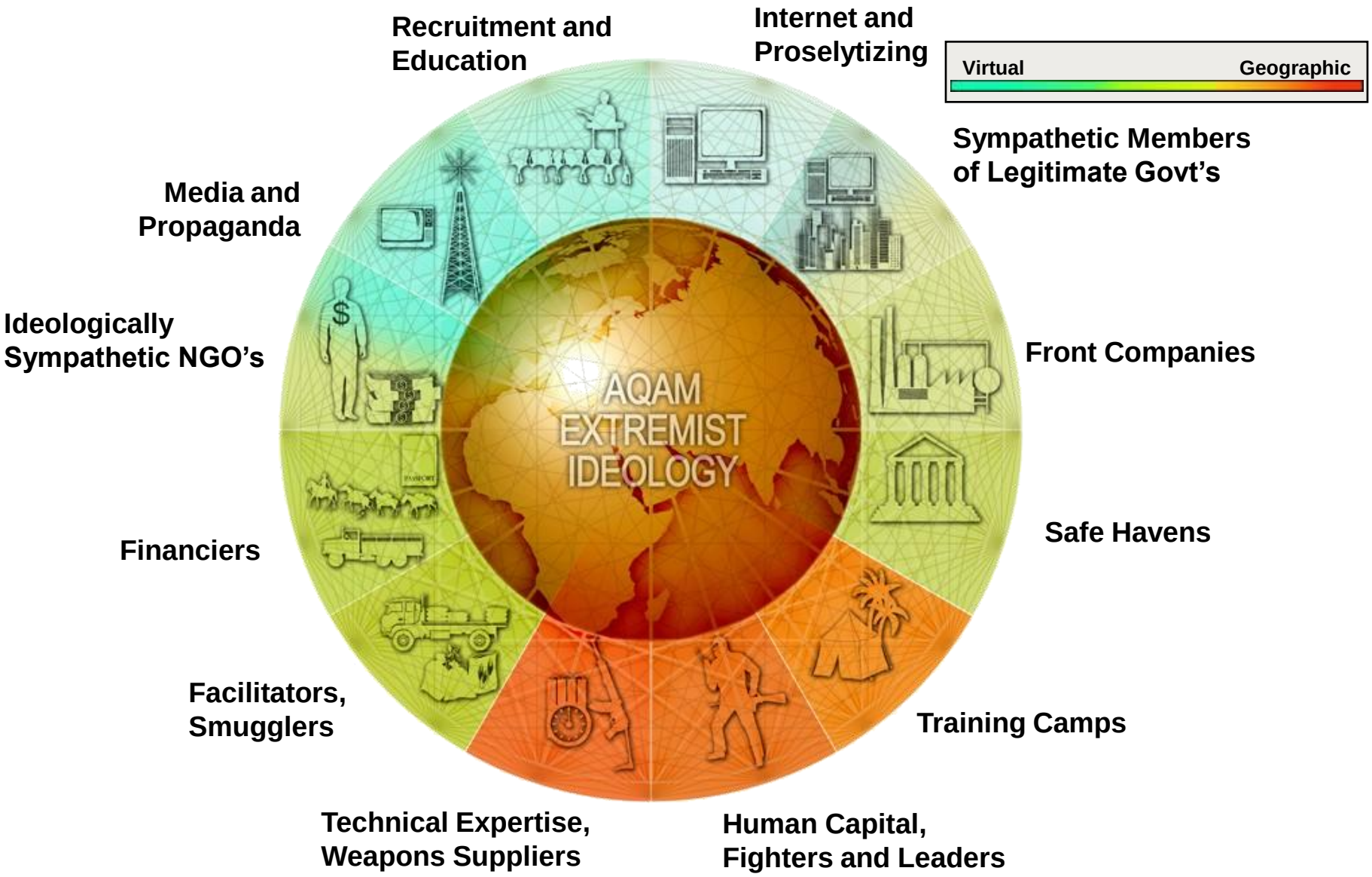
For Technology Developers Some Points to Consider

- **Seek to understand how your solution fits in the overall DoD system of systems**
  - **Integrate with legacy systems vice replace them**
  - **Open architectures receive higher interest / support**
- **Consider partnering with others to bring a ‘greater’ solution to the table - system best-of-breed vice at the component level**
- **Determine your impact to a Service program of record**
  - **Training**
  - **Initial fielding**
  - **Sustainment**
- **Substantiate your position with data**
  - **Testing**
  - **Cost-benefit analysis**

Al Qa'ida and Associated Movements (AQAM)



AQAM: A Threat in All Realms



It Takes a Network … To Defeat a Network